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Indian Standard
SPECIFICATION FOR COTTON TWINE
(*First Revision*)

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SPECIFICATION FOR COTTON TWINE
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Indian Standard

SPECIFICATION FOR COTTON TWINE

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 5 December 1978, after the draft finalized by the Cordages Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1963. The Sectional Committee responsible for the preparation of this standard decided to revise it in the light of experience gained since its publication.

0.3 To familiarize the industry with International System of Units (SI Units), the basic SI Units as well as the recommended SI Units for use in the textile industry are given in Appendix A.

0.3.1 Standards of Weights and Measures Act, 1976 also stipulates use of SI Units.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements of two varieties of cotton twine.

2. MANUFACTURE

2.1 The cotton twine shall be manufactured from cotton yarn. The strands shall be well formed and free from splices, grooves and sunken yarns. They shall have 'S' lay. The twine shall be made of three strands twisted together with 'Z' twist. It shall be well and evenly twisted.

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*Rules for rounding off numerical values (*revised*).

3. REQUIREMENTS

3.1 The cotton twine shall comply with the requirements given in Table 1.

TABLE 1 PHYSICAL REQUIREMENTS OF COTTON TWINE

Nominal Count of Single Yarn Cotton Count (tex)	Yarns/Strand	Nominal Turns/ Metre	Linear Density of Twine in tex (g/1 000 m)	Minimum Breaking Load on 50 cm Test Length N*
6^{s} (100 tex)	2	390	720	59
11^{s} (56 tex)	3	130	560	78
Tolerance —	—	—	± 5 percent	—
Method of Test —	—	—	IS : 7071 (Part II)-1974†	IS : 1670-1970‡

*1 Newton (N) is approximately equal to 0·1 kgf.

†Methods of physical test for ropes and cordages: Part II Mass, length and linear density.

‡Method for determination of breaking load, elongation at break and tenacity of yarns (*first revision*).

3.2 The rot-proofed cotton twine shall meet the following additional requirements also:

Type of Rot-Proofing	*Requirement*	*Method of Test*
a) Copper naphthenate	The copper content to be not less than 0·5 nor more than 0·8	IS : 3522 (Part I)-1966*
b) Zinc naphthenate	The zinc content to be not less than 0·8 nor more than 1·2 percent	
c) Creosote	The creosote content to be not less than 15 percent	

4. MARKING

4.1 Each skein of twine shall be marked with the following by attaching a label:

a) Name of the material;

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*Method for estimation of common preservatives used in textile industry, Part I.

b) Net mass of the bundle;
c) Manufacturer's name, initials or trade-mark, if any; and
d) Month and year of manufacture.

4.1.1 Each skein may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. PACKING

5.1 The cotton twine shall be made into skeins of suitable size, each weighing approximately 500 g; 20 such skeins shall be packed into a bundle.

6. SAMPLING

6.1 Lot — The quantity of twine of same nominal count delivered to one buyer against one despatch note shall constitute a lot.

6.2 The conformity of the lot to the requirements of the standard shall be determined on the basis of the tests carried out on the sample selected from the lot.

6.3 Unless otherwise agreed to between the buyer and the seller, the number of skeins to be selected at random from the lot shall be in accordance with col 2 of Table 2. These skeins shall be selected from at least 10 percent of the bundles; and equal number of skeins, as far as possible, shall be drawn at random from each package.

TABLE 2 NUMBER OF SKEINS TO BE SELECTED IN THE SAMPLE

No. of Skeins in the Lot (1)	No. of Skeins in the Sample (2)
Up to 100	3
101 ,, 300	4
301 ,, 500	5
501 ,, 1 000	7
1 001 and above	10

6.4 For evaluating linear density, breaking force and rot proofing content, the number of samples selected according to **6.3** shall constitute a test sample. The required test specimen shall be drawn from each of the lot and subjected to the corresponding test.

6.5 Criteria for Conformity

Sl No.	*Characteristic*	*Number of Tests*	*Criteria for Conformity*
(1)	(2)	(3)	(4)
i)	Linear density and copper naphthenate or zinc naphthenate content	According to col 2 of Table 2	$\bar{X} \pm 0\cdot4\ R$ lie within the specified values
ii)	Breaking load and creosote content	do	$\bar{X} + 0\cdot4\ R \ngtr$ specified values

NOTE — Average $\bar{X}$ is the value obtained by dividing the sum of the observed values by the number of tests and range R is the difference between the maximum and the minimum in a set of observed values.

APPENDIX A

(*Clause* 0.3)

SI UNITS

TABLE 3 INTERNATIONAL SYSTEM OF UNITS

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	CONVERSION
Force	newton	N	1 N = 0·101 972 kgf
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

TABLE 4 RECOMMENDED SI UNITS FOR TEXTILES

SL No.	CHARACTERISTIC	SI UNIT		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1)	Length	Millimetre	mm	Fibre
		Millimetre, centimetre	mm, cm	Samples and test specimens (as appropriate)
		Metre	m	Yarns, ropes and cordages, fabrics
2)	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples and test specimen (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, *DURRIES* (as appropriate)
3)	Thickness	Micrometre (micron)	μm	Delicate fabrics
		Millimetre	mm	Other fabrics, carpets, felts
4)	Linear density	Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtex	Filament and filament yarns
		Kilotex	ktex	Slivers, ropes and cordages
5)	Diameter	Micrometre (micron)	μm	Fibres
		Millimetre	mm	Yarns, ropes, cordages
6)	Circumference	Millimetre	mm	Ropes, cordages
7)	Threads in cloth:			Woven fabrics (as appropriate)
	a) Length	Number per centimetre	ends/cm	
		Number per decimetre	ends/dm	
	b) Width	Number per centimetre	picks/cm	
		Number per decimetre	picks/dm	
8)	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9)	Stitches in knitted cloth:			Knitted fabrics (as appropriate)
	a) Length	Courses per centimetre	courses/cm	
		Courses per decimetre	courses/dm	
	b) Width	Wales per centimetre	wales/cm	
		Wales per decimetre	wales/dm	

(*Continued*)

TABLE 4 RECOMMENDED SI UNITS FOR TEXTILES — *Contd*

SL No.	CHARACTERISTIC	SI UNIT		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
10)	Stitch length	Millimetre	mm	Knitted fabrics Made-up fabrics
11)	Mass per unit area	Grams per square metre	g/m^2	Fabrics
12)	Mass per unit length	Grams per metre	g/m	Fabrics
13)	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes (as appropriate)
14)	Test or gauge length	Millimetre, centimetre	mm, cm	Fibres, yarns and fabric specimens (as appropriate)
15)	Breaking load	Millinewton Newton	mN N	Fibres, delicate yarns (skeins or individual) Strong yarns (individual or skeins), ropes and cordages, fabrics
16)	Breaking length	Kilometre	km	Yarns
17)	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18)	Twist factor or twist multiplier	Turns per centimetre × square root of tex Turns per metre × square root of tex	turns/cm × $\sqrt{\text{tex}}$ turns/m × $\sqrt{\text{tex}}$	Yarns (as appropriate)
19)	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics
20)	Tear strength	Millinewton Newton	mN N	Fabrics (as appropriate)
21)	Pile height	Millimetre	mm	Carpets
22)	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m^2/mm pile height	Pile carpet
23)	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/ unit deformation	Fibres, yarns, strands

INDIAN STANDARDS
ON
ROPES AND CORDAGES

IS:	
1084-1960	Manila ropes (*second revision*)
1321-1970	Sisal ropes (*first revision*)
1410-1975	Coir ropes (*first revision*)
1804-1976	Fibre core for steel wire ropes (*first revision*)
1857-1972	Tarred hemp marline, two-ply (*first revision*)
1887-1978	Spun jute yarn, 18-ply (*first revision*)
1912-1975	Country jute twine (*first revision*)
1920-1973	Hemp lines (*first revision*)
2413-1978	Cotton twine (*first revision*)
2452-1978	Hawser-laid cotton rope (*first revision*)
2453-1978	Cable-laid cotton rope (*first revision*)
2807-1964	Whipcord
2819-1975	Braided cotton cord (*first revision*)
3252-1975	Shroud-laid cotton line (*first revision*)
3253-1965	Hawser-laid nylon rope for mountaineering purposes
3256-1965	Code for inland packaging of ropes and cordages
3262-1965	Pilot lead line
3871-1966	Glossary of terms relating to fibre ropes and cordages
4145-1967	Code of practice for storage of ropes
4572-1975	Polyamide multi-filament ropes (hawser-laid) (*first revision*)
	Part I General
	Part II Ropes for specific applications
	Part III Ropes for general purposes
4575-1973	Code for handling of fibre ropes (*first revision*)
5175-1969	Polypropylene lines and ropes for marine purposes
5176-1969	Hawser-laid hemp lines and ropes
5177-1969	Jute lines and ropes
6587-1972	Spun hemp yarn
6590-1972	Braided nylon rope for mountaineering purposes
7082-1973	Sisal lines
8674-1978	Polyethylene ropes

AMENDMENT NO. 1 JANUARY 1980
TO
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(First Revision)

Corrigendum

[*Page 6, clause 6.5, informal table, col 4, against Sl No.*(ii)] - Substitute the following for the existing matter:

'$\bar{X}-0.4R \geq$ specified values'

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- Jute mill accessories
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- Rayon fabrics
- Rayon fabrics, handloom
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- Sampling of textiles, methods for
- Silk fabrics — handloom and khadi
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